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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,054	07/11/2003	John R. Mihalisin	MP247C	4320

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Eckert Seamans Cherin & Mellott, LLC
Alcoa Technical Center,
100 Technical Center Drive
Alcoa Center, PA 15069-0001

EXAMINER

SHEEHAN, JOHN P

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 01/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/618,054

Applicant(s)

MIHALISIN ET AL.

Examiner

John P. Sheehan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 17-20 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-11 and 17-20 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 to 4, 9 to 11, 17 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Wukusick et al. (Wukusick, US Patent No. 5,100,484).

Wukusick teaches a method of making single crystal superalloy castings (Abstract) comprising casting alloys having compositions that are encompassed by the instant claims including preferably 0.04 to 0.06 weight % carbon and most preferably 0.05 weight % carbon (column 1, Table I). These carbon contents taught by Wukusick are encompassed by the carbon content disclosed by the applicants as the carbon content that is necessary to substantially reduce the formation of the as cast metallic surface scale when the super alloy is cast (specification, page 5, the last line to page 6, line 1 and page 7, lines 9 to 13). Wukusick teaches that the superalloy is cast in a mold (column 2, line 12) and solution heat treated (column 2, line 67) as recited in the applicants' claims. Claims 1 to 4, 9 to 11, 17 and 18 are anticipated by Wukusick because there is reason to believe that the reduced scale required by the claims would be obtained when practicing Wukusick's preferred and most preferred embodiments, In re Best, 195 USPQ, 430 and MPEP 2112.01.

"Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established, *In re Best*, 195 USPQ 430, 433 (CCPA 1977). 'When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.' *In re Spada*, 15 USPQ2d 655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re Best*, 195 USPQ 430, 433 (CCPA 1977)." see MPEP 2112.01.

3. Claims 1 to 11 and 17 to 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Mihalisin et al. (Mihalisin, US Patent No. 5,549,765).

Mihalisin teaches making single crystal nickel base alloys by casting in a mold (column 4, lines 40 to 45) an alloy having a composition that overlaps the alloy composition recited in the instant claims (column 3, lines 10 to 20). Mihalisin also teaches specific example alloys that are encompassed by the alloy compositions recited in the instant claims (columns 5 and 6, Tables 3 and 4 and column 9, Table 11, CMSX-4). The carbon contents of these specific example alloys taught by Mihalisin are encompassed by the carbon content disclosed by the applicants as the carbon content that is necessary to substantially reduce the formation of the as cast metallic surface scale when the super alloy is cast (specification, page 5, the last line to page 6, line 1 and page 7, lines 9 to 13). Claims 1 to 20 are anticipated by Mihalisin because there is reason to believe that the reduced scale required by the claims would be obtained when practicing the specific example alloy embodiments taught by Mihalisin, *In re Best*, 195 USPQ, 430 and MPEP 2112.01.

"Where the claimed and prior art products are identical

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or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established, *In re Best*, 195 USPQ 430, 433 (CCPA 1977). 'When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.' *In re Spada*, 15 USPQ2d 655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re Best*, 195 USPQ 430, 433 (CCPA 1977)." see MPEP 2112.01.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 to 11 and 17 to 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wukusick et al. (Wukusick, US Patent No. 5,100,484).

Wukusick teaches a single crystal nickel base alloy having a composition that overlaps the alloy composition recited in each of the applicants' claims (column 1, Table I, the Base composition). Even though Wukusick's base composition includes anywhere from 0 to 0.07 weight % carbon Wukusick provides reasons for including small controlled amounts of carbon to increase the grain boundary strength (column 9, lines 1-20) which provides motivation for including carbon in amounts greater than zero.

Wukusick and the claims differ in that Wukusick does not teach the exact same proportions as recited in the instant claims.

However, one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because the alloy proportions taught by Wukusick overlap the instantly claimed proportions and therefore are considered to establish a prima facie case of obviousness. It would have been obvious to one of ordinary skill in the art to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference, particularly in view of the fact that;

“The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages”, In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05. Further, Wukusick provides motivation to increase the carbon content of the alloy so as to increase the grain boundary strength of the alloy (column 9, lines 1 to 20).

Response to Arguments

6. Applicant's arguments filed October 28, 2005 have been fully considered but they are not persuasive.

Regarding the rejections under 35 USC 102(b) over each of Wukusick '484 and Mihalisin

Applicants argue that Wukusick '484 and Mihalisin fail to recognize the problem of metallic surface scale formation during single crystal solidification processing to make

single crystal castings and the problem of deleterious extraneous grain recrystallization during solution heat treatment of such castings. Applicants also argue that neither Wukusick '484 nor Mihalisin provide a solution to these problems. Applicants' arguments are the same as were presented in their appeal to the Board of Patent Appeals and Interferences in parent application Serial No. 09/276,858. Accordingly, the Examiner adopts the position set forth by the Board in its decision in SN 09/276,858; see the Decision on Appeal, pages 7 and 8;

Appellants argue that they have overcome problems not recognized and not solved by the Wukusick patent (Brief at 7-8). "A reference may be from an entirely different field of endeavor than that of the claimed invention or may be directed to an entirely different problem from the one addressed by the inventor, yet the reference will still anticipate if it explicitly or inherently discloses every limitation recited in the claims." *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1432 (Fed. Cir. 1997). "[M]erely discovering and claiming a new benefit of an old process cannot render the process again patentable." *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1991). Here, there is reason to believe that casting the preferred and most preferred compositions of Wukusick as taught by Wukusick will result in a reduction in scale and grain recrystallization as required by independent claims 1, 9, and 17.

Moreover, the fact that Wukusick does not discuss the same problems allegedly discovered by Appellants does not mean the claimed process is new as required by the patent statute. See 35 § U.S.C. 101(2001) ("Whoever invents any new ... process or any new ... improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.) (emphasis added). A material and its properties are inseparable. *In re Papesch*, 315 U.2d 381, 391, 137 USPQ 43, 51 (CCPA 1963). In obedience with the laws of nature, adding the amount of carbon specified by Wukusick will result in the properties desired by Appellants. "A

person of ordinary skill in the art does not need to recognize that a method or structure behaves according to a law of nature in order to fully and effectively practice the method or structure.”

EMI Group North America, Inc. v. Cypress Semiconductor Corp., 268 F.3d 1342, 1351, 60 USPQ2d 1423, 1429-30 (Fed. Cir. 2001).

Appellants also argue that the failure of Wukusick to recognize Appellants' problems and provide a solution thereto is apparent in the fact that Wukusick discloses a range of 0-0.07 weight % carbon. This range is listed for the base alloy of Table I. The presence of this broader disclosure does not overcome the fact that Wukusick describes preferred and most preferred compositions containing the required amount of carbon which would inherently result in the reduction of scale and grain recrystallization upon casting. *Cf. In re Sivaramakrishnan*, 673 F.2d 1383, 1384-85, 213 USPQ 441, 442 (CCPA 1982).

And see the Decision on Appeal, page 9,

With respect to claims 9-11, Appellants argue that Wukusick is silent with respect to controlling carbon content in the manner required by claim 9. Claim 9 recites “providing said nickel base superalloy with a C concentration controlled in accordance with the equation, % area fraction scale = $-0.193 \times \text{carbon content in ppm} + 86$ effective to substantially reduce formation of said as-cast metallic scale when the superalloy is solidified as a single crystal casting.” Again, “[a] person of ordinary skill in the art does not need to recognize that a method or structure behaves according to a law of nature in order to fully and effectively practice the method or structure.” *EMI Group North America*, 268 F.3d at 1351, 60 USPQ2d at 1429-30. The equation recited in the claim represents what happens to the % area fraction scale in accordance with the laws of nature as the carbon concentration varies. This law of nature is followed whether or not one practicing the process of providing carbon in a nickel base superalloy knows it or not. Wukusick provides carbon in an amount effective to substantially reduce formation of as-cast metallic scale as required by the claim. The carbon concentration is necessarily controlled in accordance with the equation.¹

Regarding the rejection under 35 USC 103 over Wukusick '484

Again, regarding the rejection under 35 USC 103 in view of Wukusick, applicants' arguments are the same as were presented in their appeal to the Board of Patent Appeals and Interferences in parent application Serial No. 09/276,858. Accordingly, the Examiner adopts the position set forth by the Board in its decision in SN 09/276,858; see the Decision on Appeal, pages 10 and 11;

Wukusick discloses the formation of single crystal cast articles of nickel base superalloys containing the elements required by the claims. With regard to the claims reciting concentration ranges for elements other than carbon, those ranges are encompassed by the ranges of the base alloy of Wukusick (Table I). The concentration range of carbon in the base alloy overlaps the claimed range. A *prima facie* case of obviousness typically exists when the ranges of a claimed composition encompass and/or overlap the ranges disclosed in the prior art. *E.g., In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ2d 1379, 1382 (Fed. Cir. 2003); *In re Getzler*, 116 F.3d 1465, 1469, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (CCPA 1976); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974). In addition, even though the base of alloy of Wukusick is described as including anywhere from 0 to 0.07 wt. % carbon, Wukusick provides reasons for including small

controlled amounts of carbon to increase grain boundary strength (Wukusick at col. 9, ll. 1-20). This provides a motivation for including concentrations of carbon above zero.

Appellants make many of the same arguments with regard to obviousness as made in regard to anticipation. We incorporate our responses above and add the following which additionally applies to the issue of obviousness.

With regard to the argument that Wukusick fails to recognize the problems of metallic scale and of deleterious extraneous grain recrystallization (Brief at 11), the prior art need not express the same reason or motivation for making the composition as Appellants to establish unpatentability. *In re Kemp*, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed. Cir. 1996); *see also Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Int. 1985) ("The fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.") "It is a general rule that merely discovering and claiming a new benefit of an old process cannot render the process again patentable. While the processes encompassed by the claims are not entirely old, the rule is applicable here to the extent that the claims and the prior art overlap." *In re Woodruff*, 919 F.2d at 1578, 16 USPQ2d at 1936 (citations omitted).

Also see the Decision on Appeal, page 12;

The fact that Wukusick discloses base alloys with element concentrations encompassing and overlapping the ranges of the claims and further indicates that an increased concentration of carbon is desirable provides the required basis to conclude that it would have been obvious to one of ordinary skill in the art to formulate alloys of composition within the claimed ranges for production of single crystal castings therefrom.

This is not to say that Appellants' claims are unpatentable, rather, the existence of overlapping or encompassing ranges shifts the burden to the applicants to show that their invention would not have been obvious. *Peterson*, 315 F.3d at 1329, 65 USPQ2d at 1383. Appellants do not state that they are relying upon any objective evidence for a showing of unexpected results or other secondary considerations which would be sufficient to meet this burden.

We conclude that the Examiner has established a *prima facie* case of obviousness with respect to the subject matter of claims 1-20 which has not been sufficiently rebutted by Appellants.

Applicants' reliance, in their arguments, on Figures 1A, 1B, 1C and Figure 2 as showing the importance of the carbon level to the claimed invention is not persuasive. Claims 1 to 4, 9 to 11, 17, 18, and 20 encompass any nickel base superalloy containing Cr, Co, Mo, W, Ta, and Al in any amount while claims 5 to 8 and 19 define the nickel base superalloy in terms of ranges of Cr, Co, Mo, W, Ta, and Al. However, the data in Figures 1A, 1B, 1C and 2 is based on one alloy composition wherein the carbon content is varied (specification, page 7, Table 1). Accordingly, the alloy used to produce Figures 1A, 1B, 1C and 2 is not commensurate in scope to the scope of the claims, MPEP 716.02(d). General superiority cannot be inferred from the

results obtained using a single embodiment of the claimed invention, In re Greenfield, 197 USPQ 227, 230 and MPEP 2144.08 (B).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

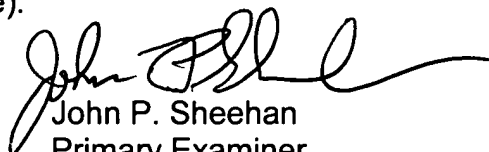
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John P. Sheehan whose telephone number is (571) 272-1249. The examiner can normally be reached on T-F (6:45-4:30) Second Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John P. Sheehan
Primary Examiner
Art Unit 1742

jps